terminal arrangement provided at a carrier plate that accepts the carrier, and having a radiation-transparent covering that encapsulates the carrier.

The paragraph beginning at page 5, line 21, has been amended as follows:

The laser diode bar or the individual diodes themselves are connected to the pin-like terminal elements with bond wires. Each laser diode thus can be directly connected to a pin-like terminal elements via a bond wire for forming a p-contact. Further, the side of the carrier that accepts the laser diode array can be at least partly covered with an electrically conductive layer, particularly a gold layer, to which the laser diode bar placed on the layer is electrically connected, and that is connected to at least one pin-like terminal means via a bond wire for forming an n-contact for the laser diode bar. As a result, the required p-contacts as well as the at least one n-contact that are required for the separate drive can be produced in a simple way.

The paragraph beginning at page 6, line 7, has been amended as follows:

In order to be able to implement the illumination units in as stable a fashion as possible, it has proven expedient to provide a laterally closed recess at the carrier in which the laser diode bar and the optical means are arranged, with the radiation-transparent covering being a plate or disk that closes the recess. A recess closed on all sides is provided for the acceptance of the relevant elements at the carrier, which is preferably a multi-layer ceramic carrier, this recess, of course, being deep enough so that the elements can be completely accepted therein. The ceramic carrier offers adequate protection on all sides and is sufficiently stable; the recess itself is then merely closed with the plate-like covering, so that a complete encapsulation is established with a simple design of the carrier as well as the covering.

The paragraph beginning at page 6, line 17, has been amended as follows:

It has proven especially advantageous for fabrication-related reasons when the optical arrangement is a pre-fabricated component part. The optical arrangement is placed completely on the carrier, which offers a considerable simplification in the assembly. The optical arrangement can be pre-fabricated as a module in this embodiment of the invention, with micro-lens systems for collimation and/or focusing as well as, if used, the deflection mirror, are arranged, for example, on a small, common carrier. The individual elements of the optical arrangement, of course, are matched to the employed laser diode bar, i.e. the succession of micro-lenses of the respective focusing systems and their number as well as the length of the deflection mirror are adapted to the spacing and number of individual laser diodes of the bar as well as to the overall length of the array, the optical arrangement also can be matched to the emitted radiation, etc. This embodiment allows the pre-fabricated component part to be specifically designed for a laser diode bar, such as a modular system for each laser diode bar employed.

The paragraph beginning at page 7, line 15, has been amended as follows:

It has proven advantageous for securing the individual elements to the carrier to secure the laser diode bar and the optical arrangement and possibly the covering as well, to the carrier with a glued connection, preferably upon using a temperature-resistant adhesive. A conductive adhesive is expediently employed for gluing the laser diode bar since the electrical contacting to the gold coating is realized thereby. The covering itself should be composed of glass, particularly anti-reflection coated glass. The laser diode bar can alternatively be secured with a solder connection.

The paragraph beginning at page 7, line 22, has been amended as follows:

A6

When the laser diode bar is operated with low power < 15 mW, the heat that thereby arises is unproblematic and can be eliminated via the carrier. Given higher laser powers in the range between 15 mW - 100 mW, this is not always possible, for which reason an arrangement for cooling the carrier is provided at the carrier, particularly in the region of the laser diode bar, in order to avoid an overheating, and thus a premature aging, of the laser diode bar. This cooling arrangement is preferably a Peltier element. This is connected via contact pins to a regulator, so that the cooling capacity can be regulated as needed.

On page 8, below line 20, insert the following paragraph:

A7

--Figure 3 is a perspective view of the laser bar used in the inventive illumination unit.--

The paragraph beginning at page 8, line 22, has been amended as follows:

A8

Figure 1 shows a first embodiment of an illumination unit 1 having a carrier 2, preferably a multi-layer ceramic carrier, at which a recess 3 is provided that is laterally closed via side walls 4 on all sides. A laser diode array in the form of a laser bar 5 with a number of separately addressable and driveable, individual laser diodes as well as an optical arrangement 6 are accepted in this recess 3. The laser bar 5 is shown in a side (end) view in Figure 1. The monolithic laser diode bar 5 typically has dimensions of length x width x height = 10 mm x 0.6 mm x 0.115 mm. The spacing of the laser diodes from one another can be between 50 μm through 2000 μm. Lengths of the monolithic laser bar 5 between 1 mm and 30 mm can be technologically realized. Any known material can be employed as semiconductor material; this is based on the desired wavelength. The bandwidth should be

extremely narrow and lie in the range of +/- 3 nanometers. Due to the monolithic array technology, a uniform radiation power and directional characteristic of all laser diodes is established, so that every diaphanoscopic image a data registration produced on the basis of the emission of one of the laser diodes is comparable to the others. The optical power (cw) should lie between 10 mW and 200 mW per individual laser diode element, whereby the optical power for the medical application should lie in the region of <100 mW/mm^2 given a laser beam diameter of <300 μm in the focus. The preferred diameter of a laser beam spot amounts to approximately 150 μm through 200 μm.

On page 9, below line 22, insert the following paragraph:

--The laser bar 5 is shown in perspective view in Figure 3.--

The paragraph beginning at page 10, line 1, has been amended as follows:

For realizing an n-contact of the laser diodes, first, the recess 3 is occupied with a conductive layer 11, preferably a vapor-deposited gold layer. The laser diode bar 5 is glued onto this conductive layer 11 with a soldered connection or a conductive, temperature-resistant glued connection 33, whereby the adhesive is also preferably temperature-resistant. The conductive layer 11 is in turn connected via on or more bond wires 12 to a further pin-like terminal element 13, which is integrated into the ceramic carrier 2 in a manner corresponding to that of the pin-like terminal element 8.

The paragraph beginning at page 11, line 8, has been amended as follows:

A further recess 24 that is arranged under the laser diode bar 5 and is provided for the acceptance of an element 25 for cooling the carrier is provided at the carrier 2. The element 25 is preferably a Peltier element. The cooling element

25 can be connected via corresponding terminals 26 to a regulator via which the cooling capacity can be regulated. The employment of a cooling element 25is expedient, particularly given laser powers >15 mW, since a complete heat elimination via the carrier 2 is then no longer assured and possible temperature elevations can lead to a deterioration of the laser diode array 5. Of course, the terminals 26 can again be fashioned as pin-like terminal elements that exit laterally at the ceramic carrier 2.

IN THE DRAWINGS

The drawings have been amended by adding Figure 3, as shown on the drawing copy marked in red attached to the Request for Approval of Drawing Changes filed simultaneously herewith.

IN THE CLAIMS

Claim 1 has been amended as follows:

1. (Amended) An illumination unit comprising:

a monolithic semiconductor laser diode bar containing a plurality of individually driveable laser diodes, each of which emits radiation;

an optical arrangement for at least one of collimating and focusing said radiation for producing a radiation beam having a substantially circular cross-section;

a common carrier on which said laser diode bar and said optical arrangement are mounted;

a plurality of pin-like terminal elements at said carrier electrically connected to said laser diode bar for transmitting drive signals to said laser diodes; and